

### **Amendments to the Claims:**

This listing of the claims will replace all prior versions, and listings, of the claims in this application.

#### **Listing of Claims:**

1. (Currently Amended) A multiple-antenna wireless device that communicates with a single-antenna enabled device across a spectrum having a plurality of sub-channels, said multiple-antenna wireless device comprising:

a plurality of antennas through which the multiple-antenna wireless device communicates with ~~a second~~the single-antenna enabled device wireless device, each antenna of the plurality of antennas communicates with the ~~second~~ single-antenna enabled device wireless device via an associated communication pathway between a subset of the plurality of antennas on the multiple-antenna wireless device and an antenna on the single-antenna enabled device;

sub-channel power analysis logic coupled to the plurality of antennas and adapted to determine a communication quality for at least two communication pathways and determine which communication pathway has a highest communication quality on a sub-channel by sub-channel basis; and

diversity selection logic coupled to the sub-channel power analysis logic and adapted to determine an antenna chain weighting vector for an associated antenna chain based on the highest communication quality, wherein the antenna chain weighting vector specifies a relative transmission power for each sub-channel for the associated antenna chain.

2. (Currently Amended) The device of claim 1, wherein the antenna chain weighting vector for the associated antenna comprises a plurality of bits, each bit corresponding to one sub-channel, and each bit indicating whether the associated antenna is used to transmit on the corresponding sub-channel.

3. (Currently Amended) The device of claim 1, wherein the antenna chain weighting vector represented in a proportional format comprises a plurality of values, each value corresponding to a sub-channel and each value being indicative of an amount of power to be provided to the associated antenna.

4. (Currently Amended) The device of claim 3, wherein the amount of power to be provided to an antenna is determined by the number of signal transmissions since the communication quality for each sub-channel of the associated communication pathway was most recently determined.

5. (Currently Amended) The device of claim 3, wherein the amount of power to be provided to an antenna is based on the communication quality of each sub-channel in the associated communication pathway.

6. (Currently Amended) The device of claim 3, wherein the amount of power to be provided to an antenna is determined by the amount of time elapsed since the communication quality for each sub-channel of the associated communication pathway was most recently determined.

7. (Currently Amended) The device of claim 1, wherein the wireless device may wirelessly communicate with a plurality of wireless stations.

8. (Original) The device of claim 1, further comprising a signal splitter coupled to the diversity selection logic and adapted to reproduce signals to be transmitted.

9. (Currently Amended) A method for a multiple-antenna device communicating with a single-antenna enabled device, comprising:

receiving data transmitted from a ~~first~~the single-antenna enabled wireless device to a second wireless device using a plurality of antennas at the second wireless device, wherein each antenna of the plurality of antennas communicates with the ~~first~~single-antenna enabled wireless device via an associated communication pathway transmit antenna chain;

determining a plurality of channel characteristics associated with each antenna of the plurality of antennas;

replicating a single antenna transmit signal in order to permit the second wireless device to communicate with the single-antenna enabled wireless device;

on a per sub-channel basis, computing an antenna chain weighting vector for each antenna chain for each sub-channel ~~of the plurality of antennas~~ based on the channel characteristics, comprising:

representing the antenna chain weighting vector using a plurality of bits, each bit corresponding to an antenna chain in a different sub-channel, and each bit indicating whether an antenna chain associated with the weighting vector is used to transmit data on the corresponding sub-channel;

for each communication pathway, combining a transmission signal in each transmit antenna chain with the antenna chain weighting vector for that antenna chain to form plurality of a weighted transmission signals;

and

concurrently transmitting to the single-antenna enabled device each the weighted transmission signal in each transmit antenna chain from the second wireless device to the first single antenna enabled wireless device via a plurality of communication pathways.

10. (Currently Amended) The method of claim 9, wherein the first single-antenna enabled wireless device transmits data to a plurality of wireless devices and receives data from a plurality of wireless devices.

11. (Currently Amended) The method of claim 9, wherein each antenna chain weighting vector specifies a relative transmission power for the antenna chain for each sub-channel.

12. (Cancelled).

13. (Currently Amended) A method for a multiple-antenna device communicating with a single-antenna enabled device, comprising:

receiving data transmitted from a first single-antenna enabled wireless device to a second wireless device using a plurality of antennas at the second wireless device, wherein each antenna of the plurality of antennas communicates

with the ~~first~~single-antenna enabled wireless device via an associated communication pathway;

determining a plurality of channel characteristics associated with each antenna ~~chain in each sub-channel of the plurality of antennas~~;

representing ~~the~~an antenna chain weighting vector in a ratio format;

wherein the ratio format specifies the amount of power to be applied to an antenna chain associated with the antenna chain weighting vector for the antenna chain for each sub-channel;

for each communication pathway, combining a transmission signal in each transmit antenna chain with the antenna chain weighting vector to form a plurality of weighted transmission signals; and

concurrently transmitting to the single-antenna enabled device each the weighted transmission signal in each transmit antenna chain from the second wireless device to the ~~first~~single antenna enabled wireless device via a plurality of communication pathways.

14. (Currently Amended) The method of claim 13, wherein specifying the amount of power to be applied to an antenna chain is based on the communication quality of each antenna chain for each sub-channel ~~in the associated communication pathway~~.

15. (Currently Amended) The method of claim 14, wherein specifying the amount of power to be applied to each antenna chain is further based on the number of data transmissions since the communication quality of the ~~associated communication pathway~~antenna chain for a given sub channel was most recently determined.

16. (Currently Amended) The method of claim 14, wherein specifying the amount of power to be applied to each antenna chain is further based on the amount of time elapsed since the communication quality of the ~~associated communication pathway~~antenna chain for a given sub channel was most recently determined.

17. (Original) The method of claim 9, wherein channel characteristics comprise a signal-to-noise ratio.

18. (Currently Amended) A system, comprising:  
an access point having a plurality of antennas; and  
a wireless station in communication with the access point via a single antenna in the wireless station;  
wherein the plurality of antennas in the access point receive a data signal from the single antenna in the wireless station via a plurality of communication pathways, each communication pathway comprising a plurality of sub-channels;  
wherein the access point determines channel characteristics and a antenna chain weighting vector for each antenna of the plurality of antennas, each antenna chain weighting vector being indicative of an amount of power to be provided to each sub-channel for an associated antenna chain;  
wherein the access point reproduces a data transmission signal, combines each copy of the data transmission signal with a different antenna chain weighting vector to produce a plurality of weighted transmission signals, and transmits

each weighted transmission signal to the wireless station via a separate communication pathway.

19. (Currently Amended) The system of claim 18, wherein the antenna chain weighting vector comprises a plurality of bits, each bit corresponding to one sub-channel, and each bit indicating whether an antenna associated with the antenna chain weighting vector is used to transmit on the corresponding sub-channel.

20. (Currently Amended) The system of claim 18, wherein the antenna chain weighting vector comprises a plurality of values, each value corresponding to a sub-channel and each value being representative of an amount of power to be applied to an antenna associated with the antenna chain weighting vector.

21. (Currently Amended) The system of claim 20, wherein the amount of power to be applied to a particular antenna for a particular sub-channel is based on the number of data transmissions since the quality of the associated communication pathway was last determined; and

wherein the amount of power to be provided to a particular antenna for a particular sub-channel is further based on the signal-to-noise ratio associated with that antenna.

22. (Currently Amended) The system of claim 20, wherein the amount of power to be applied to a particular antenna for a particular sub-channel is based on the amount of time elapsed since the quality of the associated communication pathway was last determined; and

wherein the amount of power to be provided to a particular antenna for a particular sub-channel is further based on the signal-to-noise ratio associated with that antenna.

23. (Cancelled).

24. (Cancelled).

25. (Currently Amended) A method for a multiple-antenna device communicating with a single-antenna enabled device, said method comprising:

for each of a plurality of antennas, determining a communication quality of each sub-channel of a communication pathway, the communication pathway comprising a plurality of sub-channels;

for each sub-channel, selecting an antenna chain from a plurality of antennas and providing power to each antenna chain of the plurality of antennas based on the number of data transmissions since the communication quality was most recently determined; and

concurrently transmitting data via the plurality of antennas across the plurality of sub-channels via an antenna chain for a given sub channel.

26. (Currently Amended) A method for a multiple-antenna device communicating with a single-antenna enabled device, said method comprising:

for each of a plurality of antennas, determining a communication quality of each sub-channel of a communication pathway, the communication pathway comprising a plurality of sub-channels;



for each sub-channel, selecting an antenna chain from a plurality of antennas and providing power to each antenna chain of the plurality of antennas based on the amount of time elapsed since the communication quality was most recently determined; and concurrently transmitting data via the plurality of antennas across the plurality of sub-channels via an antenna chain for a given sub channel.